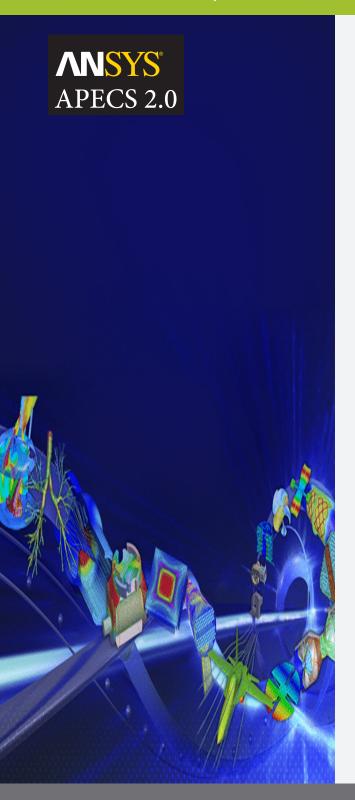# Technology Transfer

Success Story

APECS v2.0 with ANSYS® DesignXplorer™ and ROM Builder

The grand challenge facing the power and energy industries is the development of efficient, environmentally friendly, and affordable technologies for next-generation power production and chemical processing plants. These vital industries are relying increasingly on the use of sophisticated computer-aided process design and optimization tools, such as APECS v2.0 with ANSYS® DesignXplorer™ and ROM Builder. This versatile, innovative, and powerful software toolkit makes it easier, faster, and cheaper to design future plants with a high degree of confidence using advanced process/equipment co-simulation and comprehensive design optimization. Developed jointly by NETL and ANSYS Inc., the toolkit is a major enhancement of a previous R&D 100 Award-winning software tool, APECS v1.0 with ANSYS® Engineering Knowledge Manager™.

APECS v2.0, offers the following new design optimization features and capabilities:

- Support for the recently released ANSYS® FLUENT® v13.0 computational fluid dynamics (CFD) software, one of the world's leading commercial software packages for detailed flow analysis of process equipment.

- Enhanced support for advanced combustion and dense multiphase-flow gasification in ANSYS FLUENT v13.0, fostering greater innovation in rigorous process and energy plant design.

- Availability of an innovative off-line ROM Builder for systematic generation and analysis of reduced order models (ROMs) based on 2D and 3D CFD models.

- Seamless and tight integration of the APECS ROM Builder with the recently released ANSYS® DesignXplorerTM (DX) v13.0 for improved process/equipment design optimization.

Continued on back.

Contact	**NETL Technology Transfer Group** techtransfer@netl.doe.gov

U.S. DEPARTMENT OF ENERGY | **the ENERGY lab**
NATIONAL ENERGY TECHNOLOGY LABORATORY

- Access to ANSYS DX's wide variety of efficient reduced order model (ROM) and state-of-the-art design of experiment (DoE) options for enhancing the accuracy, flexibility, and performance of APECS co-simulation driven process/equipment development.

- Novel and efficient tools for generating time-averaged equipment ROMs based on transient Eulerian-Eulerian CFD simulations for use in plant-wide, steady-state co-simulations.

- First-of-a-kind capability to optimize equipment design via geometry re-meshing and parameterization in the context of an overall process optimization.

- Design productivity and workflow improvements across the enterprise with enhanced leverage of the model/data management capabilities of the latest release of ANSYS® Engineering Knowledge Manager™ (EKMTM), Version 13.0.